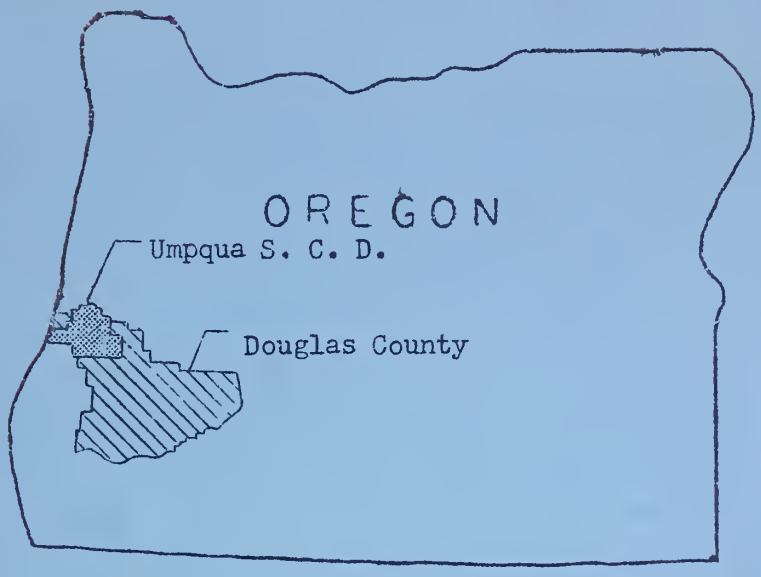
Preliminary Program Data

UMPQUA SOIL CONSERVATION DISTRICT

September 1953



RECONNAISSANCE SURVEY

For Developing

SOIL AND WATER CONSERVATION PROGRAM

in the

UMPQUA SOIL CONSERVATION DISTRICT
Douglas County, Oregon

PURPOSE AND SUMMARY

This survey of soil and water conservation problems in the Umpqua Soil Conservation District was made to provide information that would be of assistance in the preparation of a district program. The program of conservation practices and measures discussed in the following pages indicates possible lines of district activity and long range objectives toward which the people of the district may wish to proceed.

Problems of the land use in the district arise from the climate and topography. Contrasting wet and dry seasons added to the variety of sites from tidelands to interior uplands create a range of conditions seldom encountered in so small an area. All life in the area must make two adjustments annually, from wet to dry and back again. The Douglas fir seems best adapted to the situation.

Leaching, erosion, flooding and drouth follow each other in regular succession through the years. The tides provide a constant accompaniment by their threat of submergence to low lying pastures and gardens. Blowing sand constantly drifts inland to smother all vegetation in its path and push up the cost of road maintenance.

The recommended program of soil and water conservation is summarized in Table 1 on the following page by areas only. Many of the proposed measures require group or community cooperation to attain the greatest benefit. Some may be accomplished in connection with projects of the Army Engineer Corps. Most of the practices can be applied by individual owners with such technical assistance as the Umpqua Soil Conservation District Board of Supervisors can provide.

Table 1 - SUMMARY OF RECOMMENDED LAND AND WATER CONSERVATION PRACTICES

Practice	Acres to be Applied
Erosion Control	47,000 plus burned and logged forest land
Flood Prevention	5,100
Improved Irrigation	3,500
Fertilization	39,000
Land Conversion	3,000
Sand Dune Stabilization	4,400
Drainage	8,000

A description of the physical characteristics, land and water conservation problems and their recommended solution are given in the following pages.

DESCRIPTION OF THE UMPQUA SOIL CONSERVATION DISTRICT

PHYSICAL CHARACTERISTICS

Location

The Umpqua Soil Conservation District comprises about 552,000 acres in northwestern Douglas County, Oregon, extending from the shores of the Pacific Ocean eastward for about 36 miles. It includes much of the Smith River watershed and is bisected by the lower Umpqua River which empties into Winchester Bay. The cover map shows its position in relation to the state and county.

Climate

The climate of the area is characterized by long, cool, wet winters and moderately warm, dry summers. About 86 percent of the precipitation falls during the months from October through April. The average annual precipitation at Reedsport is about 74 inches and at Elkton it is about 47 inches, practically all falling as rain. Rainfall increases with the elevation to the crest of the first ridge east of the coast line. Average annual rainfall along this ridge, some 15-20 miles from the coast, is over 90 inches. The average temperature at Reedsport and in other lowland areas is about 54 degrees, with a frost free season of 190 days at Elkton and 260 days at Reedsport.

Pertinent data on climate in the district is summarized in Figure 1.

Average Temperature and Precipitation

	Temperature Record				
	Highest	Lowest	Last Spring 32°	First Fall 30°	Season
Elkton	104	17	April 22	November 1	193
Reedsport	82	23	March 11	November 24	258

Precipitation Distribution

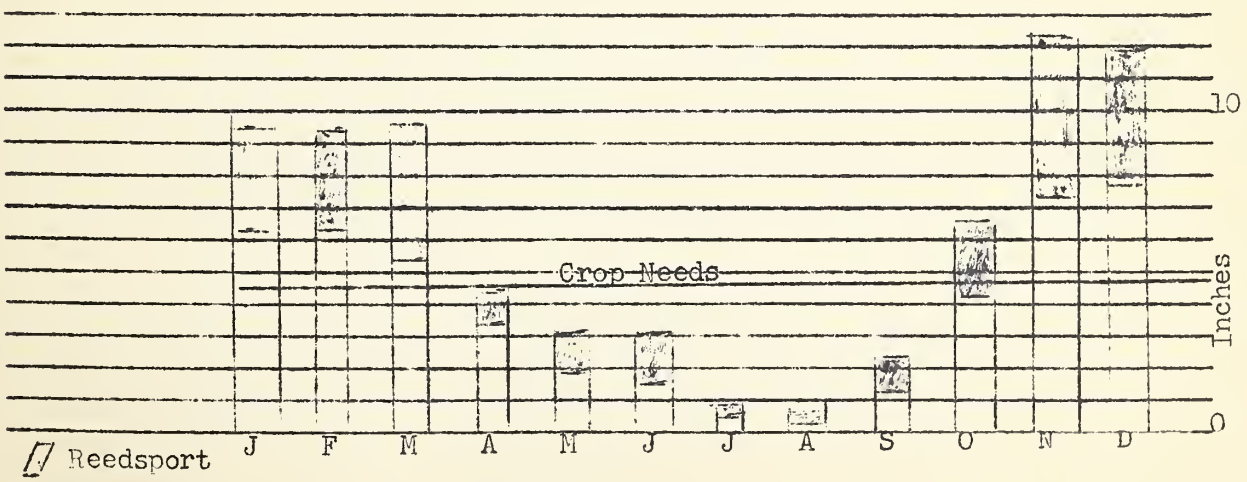


Figure 1

Geology and Topography

The rocks underlying the area within the soil conservation district consist of nearly horizontal beds of sandstone and mudstone. The dominant topographic feature is the Coast Range which extends from sea level to a maximum of 1700 feet within the district. The terrain is hilly or mountainous, except for the flood plains and adjacent terraces and the more gently sloping hills in the vicinity of Elkton.

Soils

Soil characteristics in the Umpqua Soil Conservation District are dependent chiefly on their location and origin. There are the alluvial flood plain soils, those on the higher beaches and foothill slopes, the upland residual soils on the more gentle slopes, the soils covering the steeper mountain watershed, and the dune sand area along the coast.

The soil most suitable for cultivation in the district is a very deep, medium-textured bottom soil with moderately rapid permeability in the subsoil. It occurs intermittently along the Umpqua and Smith Rivers and along tributary streams such as Lake and Elk Creeks. Deep, poorly drained, grayish bottom land and tidal flat soils are located in the tidal zones of the Umpqua and Smith Rivers and along Scholfield and Dean Creeks. Very deep, brown, medium-textured soils occupy narrow benches above the Umpqua River and on foothill slopes of the Coast Range along the west edge of the district. Because of steep slopes they are of limited agricultural value.

Upland soils which occupy gently rolling to hilly sites in the vicinity of Elkton are very deep, dark brown to red, and of medium texture. The subsoil overlying sandstone and shale is of moderately slow permeability.

Over most of the mountainous upland the soils are dark brown, medium textured, 3 feet or more in depth and with slow to moderate permeability.

The dune sands along the coast are without profile development, while a short distance inland where the dunes are generally stabilized, a loamy sand has developed over the sand subsoil.

LAND USE CAPABILITY CLASSES

Land use capabilities will become more fully realized as work in the district develops. Most of the low lands are in Classes II and III due to poor drainage and frequent flooding on the lowlands. River terrace lands and foothill slopes are in Capability Classes II to IV because of slope or depth of soil, with occasional areas so classified because of excess water.

The land use capabilities of the upland agricultural soils, specifically the soils in the vicinity of Elkton, have not been clearly established. Present indications are that due to a widespread erosion hazard and low fertility they belong chiefly in Capability Class IV, with a limited area of Class II where the land is comparatively level.

Most of the mountainous portion of the district is in Capability Classes VI and VII, and is in its best use as forest land.

LAND USE AND OWNERSHIP

The Umpqua Soil Conservation District includes approximately 552,000 acres, 268,000 being publicly owned and 284,000 privately. Large areas of the privately owned land are in forest and may be managed in conjunction with the public forest land.

The public land is practically all in forest use. Privately owned land is used about as follows: forest, 223,000 acres; crop land, 27,000 acres; range, 34,000 acres. The cropland area includes 17,500 acres being used as pasture, in a long rotation that recognizes the best present use as grass land.

Crop land of the district is distributed as follows: pasture, 20,590 acres; hay and grain, 3,460 acres; potential, presently wet or uncleared, 2,590 acres; orchard and row crops, 360 acres.

Table 2 - LAND OWNERSHIP AND USE

Ownership	Land Use (Acres)					
	Forest	Range	Non Use (Dunes)	Crop Land		
				Dry	Irrigated	Total
Federal & State	265,600		2,400			
Private	221,000	34,000	2,000	26,600	400	27,000
Totals	486,600	34,000	4,400	26,600	400	27,000

Problems and Program

The objective of any soil conservation program is to attain the highest use of each acre of land consistent with its needs to maintain permanent high production. Economic conditions may dictate different types of farm enterprises or farm abandonment in extreme cases but the ultimate aim of maximum safe production will force other issues aside when the need becomes acute.

Dedication of land to its highest use involves many practices, from diking out the tides to eradicating dandelions according to the problems of a given site.

The problems and program of the district will be discussed as they relate to land use whether affecting forest land, crop land or range. Some problems are related to more than one land use in which case the treatment of cause and effect may be found under separate land use sections.

CROPLAND

Erosion

Bank Erosion

Bank erosion problems are localized on scattered reaches along the Umpqua River, North Fork of Smith River, and along Johnson Creek. Stream banks become vulnerable to erosion where meanders divert the current against them during moderately high stages of the streams. The North Fork of Smith River follows a tortuous course through its lower reaches creating problems of accessibility to land, caused by shifting of the stream channel. The fact that the bank erosion problem is only of limited importance is partly due to the absence of a coarse bed load because flow of the streams is over bedrock. In tidal reaches current action is moderated by the influence of backwater. Luxuriant growth of vegetation along the banks also generally affords protection.

Upland Erosion

There are two causes of upland erosion occurring in the Umpqua Soil Conservation District. One develops because of cultivation of sloping bench and hill soils largely in the vicinity of Elkton. These soils are generally non-cohesive and are susceptible to erosion during the rainy season if the cover is disturbed by tillage. In the past, a total of about 2300 acres have been subjected to erosion by fall tillage operations. In recent years this has been reduced to about 500 acres by conversion to pasture. Sheet erosion is the predominate type, while gully development is comparatively rare. When left undisturbed, land quickly regains a protective vegetative cover because of the long rainy season and mild climate. Long continued sheet erosion is indicated by the shallow top soil and lack of organic matter over much of the upland area.

Erosion Prevention

Bank Protection

The remedial program for the protection of eroding banks includes two types of measures, mechanical and vegetative. Mechanical measures needed include jetties, riprap and revetments as well as realignment which might be required as on the North Fork of the Smith River. Applicable vegetative controls include the planting of grass, shrubs or trees. It is estimated that about 5 miles of bank protection works will be needed for the maintenance of stream channels in the district.

Treatment of Sloping Agricultural Land

A six to eight year grass-legume rotation including fertilization should be established on Class IV land now in cultivation to build up organic matter content and prevent further erosion. Approximately 200 acres in the Elkton area require conversion to grassland. There are about 27,000 acres of potentially cultivated, cleared or partly cleared land. Much of this land will need a rotation of green manure or cover crops as a protection against erosion. About 7,000 acres will need cultivation on the contour and 2,000 acres should be strip cropped.

Flooding

Damage from floods consists chiefly of inundation over periods of time which vary according to locality from many weeks to only a few hours. The low-lying lands adjacent to the Smith and Umpqua Rivers are annually flooded by high runoff, usually combined with either high tides or offshore winds. Once flooded, some of the fields remain under water until the end of the rainy season. Local runoff also contributes to the flood problem because of inadequate channels across the flood plains to the stream channels. Flood prevention and drainage are so closely related as to be almost inseparable during the rainy season. Following the wet season when stream flow subsides, there still remains the control of tidal invasion from below and removal of seepage waters from above, if agricultural enterprises are to be successful.

There are approximately 2300 acres of land frequently flooded over an extended period in the Umpqua District. Of this amount, about 1200 acres are along the Smith River below Eslick Creek and 600 acres are along the Umpqua River, below Harvey Creek. The remaining 500 acres are on the floodplains of Scholfield and Dean Creeks.

Lands which are frequently flooded for short periods of time occupy sites above the influence of tidewater. These areas are inundated from the stream flow during high flood stages or through gaps in natural levees during lower flood stages. Depressions and drainage swales are also frequently inundated by runoff from adjacent hills. Overflow damage to land is relatively minor at the present time because of soil protection by grass and other vegetation. If cultivated crops are grown on such land, greater damage will result. The present flood damage consists chiefly of

reduced yields because of poor drainage due partly to inadequate outlets for runoff. Agricultural land which is frequently flooded for short periods includes about 800 acres on the Smith River and about 2,000 acres along the Umpqua and in tributary valleys, including those of Lake, Scholfield, Paradise, Elk and Dean Creeks.

Flood Prevention and Drainage

The watershed practices designed to reduce or prevent erosion will have a minor effect on peak flows in the areas now subject to damage. The relatively quick recovery of protective vegetation after logging or fires, and the generally localized nature of the damage areas are factors limiting the benefits of a watershed program. More direct benefits can be secured through diking, improvement of existing channels and construction of diversions. Dikes to protect lands subject to tidal influences have already been built along the Umpqua and Smith Rivers, though some need to be repaired. In order to prevent frequent flooding of marsh areas, about 7 miles of diking are needed adjacent to Scholfield Creek, Winchester Creek, and Dean Creek. This measure would protect about 740 acres.

Diversions are needed to intercept runoff from slopes adjacent to the crop land. They are required over the entire district but particularly along the stream bottoms. It is estimated that about 80 miles of diversions will be needed in the district.

Channel improvements such as enlargement, clearing or straightening will be required along brush-grown or meandering reaches of Scholfield, Lake, Dean and Otter Creeks and the North Fork of Smith River. Improvements will also be needed in the channels of small streams that cross river plains, particularly those now diked, to prevent flooding. Approximately 15 miles of such work will be needed.

Drainage

Tidal Drainage

Tides affect the drainage situation about the same distance up both the Umpqua and Smith Rivers, extending to Dean Creek on the Umpqua and to Eslick Creek on Smith River. Each tributary between these points and the coast terminates in a tidal flat of varying size but of uniform wetness, the degree of severity varying with elevation above sea level. Other areas within reach of the tides are Scholfield Creek (2.5 miles), Winchester and Silver Creeks ($1\frac{1}{2}$ miles), and Dean Creek (2 miles).

These lower areas, indicated on the map by the symbol), are subject to flooding, rainfall, and tidewater fluctuations making a three-way program of flood protection, surface drainage and tide gates essential to utilization beyond the wet pasture level. Surface drainage can be accomplished by a combination of land leveling and drainage laterals. The leveling is suggested to eliminate ponds and low spots where water might stand too long for crop growth, and the laterals to conduct excess water to the outlet channel.

In this class of tidewater drainage about 4,000 acres could be benefitted. Needs include 20 tide gate installations, 1,000 acres of land leveling and 18 miles of drainage channel construction. In addition, approximately 15 miles of new dike will be required unless constructed as part of the flood prevention job.

Table 3 - TIDELAND, FLOOD PREVENTION AND DRAINAGE PRACTICES NEEDED

Stream	Dike	Tidegates	Channels	Area Benefitted
	Miles	Number	Miles	Acres
Umpqua River	-	8	4	1,500
Smith River and Otter Slough	2	8	7	1,500
Dean Creek	4	1	1	200
Winchester Creek	2	1	2	200
Scholfield Creek	4	2	4	600
Totals	12	20	18	4,000

Wet Areas Above Tideland

Drainage problems also occur on agricultural land above that affected by tides or floods. Very little of the precipitation falls as snow so is quickly removed from sloping areas as stream flow. Where adequate drainage exists the excess water escapes before it becomes a problem in crop production. If, however, a clay layer or rock outcrop prevents internal drainage or the topography interferes with surface runoff, a perennial trouble spot results.

Uncultivated upland wet areas may be identified during the dry season by the presence of sedges, or ash trees. If cultivated they produce dock and foxtail with poor yields of grain or hay because of the delayed growing season. They are the result of either slow percolation through the soil or of a seasonal high ground water table. The first condition may be corrected by surface drainage and the second with tile or deep open drains. Tile is recommended for small areas.

Localities where such upland drainage is required include those agricultural areas above tideland on Smith River, North Fork Smith River, Scholfield, Winchester, Dean, Johnson, Harvey, Lake, Soup, Wells, Weatherly, Paradise, and Elk Creeks and the bottom lands along the Umpqua River to the south boundary of the district. They are represented by the cultivated land above tideland as shown on Map No. 1.

Topography of the upland areas generally encourage rapid runoff and good surface drainage with only occasional seepage areas. Frequently these seeps can be developed for stock water by using a collection gallery and pipe. If not needed for watering places a tile line to an outlet channel will usually correct the situation.

Combined with tile laterals and leveling, where required, drainage systems, where installed, will increase the growing season by two months with consequent increase in usable production. Where the land is not too wet for early cultivation weed control is more difficult.

Table 4 - QUANTITIES OF DRAINAGE PRACTICES NEEDED ABOVE TIDELAND AREAS

Location	Type of Measure			Area Benefitted
	Pump	Tile	Leveling	
	No.	Miles	Acres	Acres
Umpqua Bottoms	-	20	200	1,500
Smith River and Otter Slough	-	-	1,000	2,500
Dean & Johnson Creeks	2	-	400	500
Wade Flat	-	-	500	500
Scholfield Creek	1	-	200	320
Harvey Creek	-	-	100	130
Lake Creek	2	5	400	1,200
Soup Creek	-	-	200	550
Wells Creek	-	1	-	600
Paradise Creek	-	2	-	400
Elk Creek	-	2	-	1,500
Hill Land	-	0.5	-	200
	5	30.5	3,000	9,900

CROP PRODUCTION AND FERTILITY

PRODUCTION LEVEL

Fertility Depletion

The pasture and crop yields throughout the district are normally low. The estimated average yield of pastures does not exceed 4 animal unit months each year from an acre of pasture. Hay yields are estimated at 1-1/4 to 2 tons, while oat yields average from 20 to 35 bushels per acre. The low production level is due, in part, to the general lack of fertility. In the past, little effort has been made to return to the soil plant nutrients removed by pasture and crop production. The original fertility level of the land was not high and the leaching effect under rainfall conditions of 50 to 70 inches each year tends to reduce soil fertility. This factor, coupled with the removal of plant nutrients by continuous cropping, has brought about the present low level of production.

Large areas of upland in the vicinity of Elkton were open pasture areas when first settled. These areas were broken up and cropped to grain for a number of years. Little or no regard was given to erosion prevention, the replacement of plant food, or maintenance of organic content of the soil. Consequently, yields were reduced to a point where it was no longer profitable to raise grain and the land use reverted back to pasture.

Much of the bottom and first bench lands along the rivers have been used for the continuous production of hay and grain. Yields on these lands are noticeably low, indicating a lack of fertility. Exact shortages of plant nutrients is unknown except that a deficiency of nitrogen and calcium is apparent.

At one time considerable acreage was set out to orchards which are now largely abandoned. Probably one of the factors contributing to abandonment of the orchards was the failure to recognize the inherent low fertility level of the land.

Summer Drouth Periods

Choice of crops on most of the cropland area is governed by the precipitation distribution which is insufficient during the summer months to sustain plant growth. A summer dormant period is thereby forced on all unirrigated crops thus wasting the best growing period of the year through lack of moisture. Diversification is limited to annual crops of grain and hay or a drouth resistant perennial pasture. The annual cropping pattern demands annual plowing with consequent erosion during the wet season.

Fertility Improvement

A program to correct the low fertility problem of the soils should

take into consideration the following farm practices:

1. Use of crop residues.

2. Establishment of crop rotations which include deep rooted perennial grasses and legumes.

3. The careful preservation and use of barnyard manures, including the liquid manure.

4. Green manure crops to retard the leaching of plant nutrients during the period of heavy rainfall.

5. The application of commercial fertilizers and lime.

Because of the general lack of information as to the quantities of lime and fertilizer that should be used, it is recommended that trial plots and pilot studies under field conditions be made in order that more definite recommendations can be established.

IRRIGATION

Irrigation Development

The irrigated land in the Umpqua Soil Conservation District consists of approximately 500 acres of bottom land lying along the major streams. Irrigation water, in general, is pumped from the adjacent stream through individually owned systems. The irrigated areas are generally small, from 20 to 60 acres per farm. They are largely used for the production of pasture and hay. The development of irrigation has been comparatively recent and well scattered throughout the district. The water is applied by sprinkler and by surface methods.

Additional Irrigation Requirements

Although the annual rainfall varies from 50 to 70 inches over the district, there is still a definite need for irrigation. Most of the precipitation occurs from October to May each year. During the three and one-half months from the middle of June through September there is insufficient moisture to keep pastures growing or to produce a second cutting of hay. The farms of the district are particularly adapted to dairying in the bottom lands and the raising of livestock on the upland grazing areas. Both of these enterprises require a supply of summer feed as well as winter hay. Feed requirements can best be met by the irrigation of pastures and hay fields.

Potential Irrigation Development

There are approximately 27,000 acres of land suitable for cultivation in the district. This land lies along the Umpqua and Smith Rivers and on the plateau between Elkton and Kellogg. At the present time the production

of some of the best of this land is impaired by inadequate drainage and the influence of tidal action. If these areas were improved by drainage and protected from overflow, approximately 8,140 acres could be readily irrigated by pumping from the Umpqua and Smith Rivers. The pumping head would be low and the cost quite reasonable. Another 2,600 acre area also could be irrigated by the installation of a more elaborate system of pumps and canals to convey water from the Umpqua River. There is also the possibility of constructing storage reservoirs on some of the tributary streams where summer flows do not meet the irrigation requirements. A reservoir site on Paradise Creek is typical of such locations. However, these sites have not been investigated sufficiently to fully evaluate their potentialities.

It is recommended that the future development of irrigation should in general take place on the bottom and low-lying bench lands along the Umpqua and Smith Rivers and the tributaries having adequate water available. The size of the projects would be limited to individual farms or small groups. They should be designed to provide the necessary summer pasture and winter hay requirements needed to round out the farm economy. In a few instances specialized crops may be irrigated.

It is difficult to foresee the ultimate irrigation development in the district; however, it is not unreasonable to expect future irrigation developments to reach 10,000 acres.

Table 5 - CROPLAND CONSERVATION NEEDS

Practice	Unit	Amount
Erosion Prevention	Acres	19,000
Contour Cultivation	Acres	7,000
Strip Cropping	Acres	2,000
Bank Protection	Miles	5
Flood Prevention	Acres	4,000
Diking	Miles	7
Diversions	Miles	80
Channel Improvement	Miles	15
Drainage	Acres	8,000
Leveling	Acres	3,000
Tidegates	Number	20
Channels	Miles	18
Tile	Miles	30
Pumps	Number	5
Irrigation	Acres	10,000
Systems	Number	200
Reservoirs	Number	20
Fertility and Land Management		
Weed Control	Acres	27,000
Crop Residue Use	Acres	23,000
Crop Rotation	Acres	27,000
Green Manure	Acres	27,000
Fertilizer	Acres	27,000
Liming	Acres	10,000

RANGE

Erosion

Cover Depletion

All of the range area seems well protected from erosion by a close knit cover of weeds, plantain, fescue, bent or an annual grass. Roads and stock trails sometimes concentrate runoff resulting in gullies in spite of a good general cover by exposing the raw soil on a pasture slope. Excessive grazing on part of the hilly range may also deplete cover to the point where erosion can begin. The greatest problem of cover management is to maintain a stand of palatable and productive grasses.

Cover Maintenance

Cover maintenance requires the establishment of improved grasses and legumes and the eradication of undesirable plants. These may be accomplished by fencing, seeding and fertilizing, stock water development, weed spraying, and rotation of stock. Fire control is as important a practice in range maintenance as it is in the forest.

These practices apply to approximately 34,000 acres of land in the district and, if the present pasture program prevails on cropland, on some 17,000 acres more. They must be supplemented by adequate stock management if they are to prove effective. Time and rate of stocking should be adjusted so far as possible to the condition of the range cover, for greatest meat or wool production as well as forage cover maintenance.

Table 6 - RANGE CONSERVATION NEEDS

Practice	Unit	Amount
Cover Improvement	Acres	34,000
Road and Trail Protection	Miles	10
Weed Eradication	Acres	20,000
Reseeding	Acres	30,000
Fencing	Miles	10
Fertilizing	Acres	12,000
Rotation & Deferred Grazing	Acres	34,000
Stockwater Developments	Number	30

FOREST LAND

Erosion

Cover Destruction

A condition leading to accelerated bank cutting is developing as a result of logging along the steep stream courses. On Weatherly Creek it was noted that slash is collecting in the form of log jams. These jams form temporary dams which give way during flood flows, releasing surges of water that scour the bottom and cut away alluvial material from the banks.

Other causes of accelerated watershed erosion are logging operations and forest fires. Logging operations disturb the ground cover by movement of machinery, development of skid trails and construction of access roads.

Forest fires destroy the ground cover as well as timber, creating conditions favorable for both sheet and gully erosion to remove a part of the shallow surface soil before regrowth has had an opportunity to take effect. The results of a large fire known as the Vincent Creek burn of 1951 are evident in the sediment deposited in stream channels leading out of the burned area. This fire was one of the largest to have occurred in the District in modern times, covering about 30,000 acres in Vincent and Weatherly and other watersheds tributary to the Smith and Umpqua Rivers.

Erosion Prevention

On the forested watershed clear cutting in blocks of 40 to 60 acres with no logging across stream channels will assure early restocking and reduce the hazard of accelerated runoff. In addition to these measures, replanting immediately after logging or forest fires will help prevent the loss of soil during the subsequent winter rains. Consderable success has been reported from reseeding of the Vincent Creek burn with mustard and Douglas fir seeds. Mustard protected the soil during the first season and provided a stable seed bed for the germination of the tree seeds. Planting of young trees from nursery stock should be done as needed to accelerate restocking.

As a protection against the development of large fires, such as the Vincent Creek burn, and to hold the number of occurrences to a minimum, encouragement for the construction of well-planned access roads should be a major project of the Soil Conservation District. Protection from erosion depends on the preservation of organic and vegetative cover on the watersheds. Since fire is the greatest offender, a net of access roads would effectively aid in holding areas of erosion to a minimum. Another phase of this program is the proper management of slash such as the falling of snags, cleanup and controlled burning.

To prevent the collection of logs and logging debris along the bottom of streams, a stream-side strip of timber should be left standing in vulnerable areas. These areas would be along tributaries above places of urban or agricultural development where flood and sediment flows would cause serious damage. Road and skid trails should be so located as to avoid unstable geologic zones, fills should be seeded and adequate drainage provided.

Protection from erosion of cutover or burn areas is accomplished through natural process of vegetative invasion. Best use of the land resource implies a conscious effort to restock forest areas with a desirable species so a program of restocking as indicated above goes beyond the bare need of erosion control.

Table 7 - FOREST CONSERVATION NEEDS

Practice	Unit	Amount
Erosion Prevention	Acres	491,000
Block Cutting	Acres	491,000
Replanting	Acres	150,000
Stream Strips	Miles	250
Roads	Miles	500
Slash Disposal	Acres	491,000

MISCELLANEOUS PROBLEMS

LAND CONVERSION

Adjustments in land use do not loom large as a problem in the Umpqua Soil Conservation District. In general, the land is now being used for the purpose for which it is best suited. Recommended changes in land use are largely in the form of land development. There are approximately 560 acres in low-lying wet areas that may be converted from swamp marsh land to the production of pasture and hay. This will require the installation of drainage facilities, including the dikes and tidegates, discussed in the flood prevention and drainage section.

There are also approximately 730 acres of peat and wet land with a cover of stumps, brush and trees that might be cleared and drained for farm crops. A large proportion of the farms contain small areas of brush, stumps and trees that could be cleared and cultivated. It is estimated that these areas would total about 1,150 acres.

A small portion of the upland area is now being cultivated for the production of grain and hay. Approximately 200 acres of this land should be seeded down to grass under a long rotation to maintain maximum production.

COASTAL SAND MOVEMENT

Sand Dune Encroachment

The coastal beach areas of the Umpqua Soil Conservation District extend for a distance of 11 miles along the Pacific Ocean both north and south of Winchester Bay. The sand dune area varies in width from 1/2 to 3/4 mile. The critical area subject to movement of sand covers approximately 4,400 acres. These areas are normally held stable by vegetative cover. However, once a small area becomes subject to blowing by disturbance or removal of the native grass and trees, the drifting sand buries and destroys the vegetative cover, thereby progressively enlarging the area subject to dislocating wind action.

The movement of sand by the prevailing winds is in a northeasterly and southeasterly direction. The rate of sand encroachment varies from 3 feet to over 60 feet per year.

In the past the damage from sand encroachment has been largely confined to forest land. However, if left uncontrolled, the future encroachment of sand will cause extensive damage to Highway 101, forest land, residential and recreation areas and the water supplies for the City of Reedsport and Winchester Bay. Shifting sands may also increase the cost of maintaining navigation on the Umpqua River.

Sand Dune Control

A program to control the encroachment of sand should be started on the critical and more active areas first. The stabilization of these areas is obtained best by the use of vegetative measures. The program should include the following steps:

1. The planting of beach grasses over the entire area to be stabilized.

2. Fertilize with 200 pounds of nitrogen per acre after planting to grass.

3. Plant and seed to secondary grasses.

4. Plant to trees and shrubs (Scotch pine and Scotch broom).

It is very important that the control areas be protected by non-use to maintain an adequate cover at all times. The cost of the stabilization program is estimated to be $250 per acre.

GORSE CONTROL ON RIGHTS-OF-WAY

The problem of gorse control along roads, highways, rivers, and vacant land is probably of sufficient importance to warrant receiving special attention. Growth habits of the plant make it a major threat to coastal pasture and potential forest lands.

Eradication of gorse within rights-of-way should be done before it has an opportunity to spread into adjacent property. Cooperation of the State Highway Commission, County Road Supervisor and other road-making agencies, as well as the railroad company, is required to avoid the invasion of gorse through these lanes. Approximately 75 miles of various types of rights-of-way will be affected, principally in the western part of the district.